WHAT IS CLAIMED IS:

1. A motor controlling device, comprising:

an acceleration detector for detecting an acceleration of a motor;

a motor driver for supplying a driving current to the motor;

a heat quantity calculator for calculating a heat quantity generated in the motor at least based on an output from the acceleration detector; and

a motor controller for controlling the motor driver based on the heat quantity.

2. A motor controlling device according to claim 1, wherein:

the acceleration detector includes:

a movement distance indicating device for detecting a prescribed movement distance of the motor; and

a timer for counting a time period required for the motor to move the prescribed movement distance, and

the acceleration detector calculates the acceleration based on an output from the movement distance indicating device and an output from the timer.

3. A motor controlling device according to claim 1, wherein the heat quantity calculator stores the relationship between the acceleration and the heat quantity, and calculates the heat quantity at least from the acceleration which is output from the acceleration detector based on the relationship.

4. A motor controlling device according to claim 1, wherein the heat quantity calculator calculates the heat quantity at least based on a first value obtained by multiplying a

square of the acceleration by a first constant.

5. A motor controlling device according to claim 4, further comprising an inertia determiner for determining an inertia of a load when the motor is driven, wherein the first constant is changed by an output from the inertia determiner.

6. A motor controlling device according to claim 2, wherein:

the acceleration detector calculates a prescribed rotation distance by multiplying the prescribed movement distance by a prescribed integer, and

the heat quantity calculator calculates the heat quantity at least based on a sum of a first value obtained by multiplying a square of the acceleration by a first constant and a second value obtained by multiplying the prescribed rotation distance by a second constant.

7. A motor controlling device according to claim 6, further comprising an inertia determiner for determining an inertia of a load when the motor is driven, wherein the first constant is changed by an output from the inertia determiner.

8. A motor controlling device according to claim 1, wherein the accelerator detector includes:

a movement distance indicating device for detecting a prescribed movement distance of the motor and generating a pulse at each prescribed movement distance,

a timer for counting a time duration between generations of the pulses, and

a speed calculator for calculating a speed of the motor from the time duration each time the motor moves a prescribed rotation distance which is obtained by multiplying an integer the prescribed movement distance,

wherein the acceleration detector calculates the acceleration from the speed.

9. A motor controlling device according to claim 8, wherein the prescribed rotation distance is equal to a value obtained by multiplying by an integer the rotation distance corresponding to one rotation of the motor.

10. A motor controlling device according to claim 2, wherein the acceleration detector includes:

a movement distance indicating device for generating a pulse each time the motor moves a prescribed angle D,

a speed calculator for calculating a rotation speed N(n) of the motor by expression (1) each time the movement distance indicating device generates the n'th pulse, and

a differential calculator for calculating an i'th acceleration A(i) by expression (2) each time j pulses are generated:

$$N(n) = D/\Delta tp(n) \quad \text{..... expression (1)}$$

$$A(i) = (N(j \cdot i) - N(j \cdot (i-1)))/\Delta t(i) \quad \text{..... expression (2)}$$

where n, i and j are positive integers, $\Delta tp(n)$ is a time duration between the time when the n'th pulse is generated and the time when the (n-1)th pulse is generated by the movement distance indicating device, and $\Delta t(i)$ is a time duration between the time when the $(j \cdot i)$th pulse is generated and the when the $(j \cdot (i-1))$th pulse is generated by the movement distance indicating device.

11. A motor controlling device according to claim 10, wherein j is a value obtained by multiplying by an integer the number of pulses which are generated by the movement

distance indicating device while the motor rotates once.

12. A motor controlling device according to claim 10, wherein:

the acceleration detector includes a digital filter for receiving the rotation speed N(n) of the motor and outputting an average rotation speed N'(n), and

the differential calculator calculates the acceleration A(i) using the average rotation speed N'(n) instead of the rotation speed N(n).

13. A motor controlling device according to claim 12, wherein the digital filter calculates the average rotation speed N'(n) by expression (3):

$$N'(n) = (N(n) + (m-1)\cdot N'(n-1))/m \quad \text{..... expression (3)}$$

where m is a positive integer.

14. A motor controlling device according to claim 1, wherein:

the motor controller includes:

a temperature calculator for calculating at least one of a temperature change of the motor and a temperature change of a driven target of the motor based on the heat quantity calculated by the heat quantity calculator, and

a current controller for restricting a driving current which is output by the motor driver, and

when the temperature change exceeds a prescribed threshold level, the motor controller sets a restriction value of the driving current.

15. A motor controlling device according to claim 14,

wherein the restriction value is changed in accordance with an amount by which the temperature change exceeds the prescribed threshold level.

16. A disk apparatus, comprising:

a motor for rotating a disk;

an optical head for recording information on the disk or for reproducing information from the disk;

a motor driver for supplying a driving current to the motor;

a motor controller for setting the driving current;

a speed calculator for calculating a rotation speed of the motor; and

a determiner for determining whether or not the rotation speed of the motor is within a range in which recording of information to the disk or reproduction of information from the disk by the optical head is possible,

wherein when the determiner determines that the rotation speed of the motor is within the range, the motor controller restricts the driving current.

17. A disk apparatus according to claim 16, wherein the motor controller sets the restriction value of the driving current to be higher as an intended rotation speed of the motor increases.

18. A disk apparatus according to claim 16, wherein the motor controller sets the restriction value of the driving current to be higher than the restriction value at the time of a start of an acceleration of the motor, before the rotation speed of the motor is maintained at the intended rotation speed.

19. A disk apparatus according to claim 16, further comprising:

an acceleration detector for detecting an acceleration of the motor,

a heat quantity calculator for calculating a heat quantity of the motor at least based on the acceleration which is output by the acceleration detector, and

a temperature calculator for calculating a temperature change in a prescribed area of the disk apparatus based on the heat quantity,

wherein the determiner determines whether or not the temperature change is equal to or less than a prescribed threshold level,

when the determiner determines that the temperature change is equal to or less than the prescribed threshold level and that the rotation speed of the motor is within the range, the motor controller restricts the driving current, and

when the determiner determines that the temperature change is more than the prescribed threshold level, the motor controller restricts the driving current.

20. A disk apparatus according to claim 19, wherein the motor controller sets the restriction value of the driving current to be higher as an intended rotation speed of the motor increases.

21. A disk apparatus according to claim 19, wherein the motor controller sets the restriction value of the driving current to be higher than the restriction value at the time of a start of an acceleration of the motor, before the rotation speed of the motor is maintained at the intended rotation speed.

22. A disk apparatus, comprising:

a motor for rotating a disk;

an optical head for recording information on the disk or for reproducing information from the disk;

a motor driver for supplying a driving current to the motor;

a motor controller for setting the driving current;

a synchronous clock generator for generating a synchronous clock based on a reproduction signal which is read from the disk by the optical head;

a speed calculator for calculating a rotation speed of the motor; and

a determiner for determining whether or not the rotation speed of the motor is within a range in which generation of the synchronous clock is possible,

wherein when the determiner determines that the rotation speed of the motor is within the range, the motor controller restricts the driving current.

23. A disk apparatus according to claim 22, wherein the motor controller sets the restriction value of the driving current to be higher as an intended rotation speed of the motor increases.

24. A disk apparatus according to claim 22, wherein the motor controller sets the restriction value of the driving current to be higher than the restriction value at the time of a start of an acceleration of the motor, before the rotation speed of the motor is maintained at the intended rotation speed.

25. A disk apparatus, comprising:

a motor for rotating a disk;

an optical head for recording information on the disk or for reproducing information from the disk;

a motor driver for supplying a driving current to the motor;

a motor controller for setting the driving current;

a speed calculator for calculating a rotation speed of the motor; and

a determiner for determining whether or not the optical head is recording information to the disk or reproducing information from the disk, and whether or not the rotation speed of the motor has changed,

wherein when the determiner determines that the optical head is not recording information to the disk or reproducing information from the disk and that the rotation speed of the motor has changed, the motor controller restricts the driving current.

26. A disk apparatus, comprising:

a motor for rotating a disk;

an optical head for recording information on the disk or for reproducing information from the disk;

a motor driver for supplying a driving current to the motor;

a motor controller for setting the driving current;

a head transporting device for transporting the optical head to a prescribed position above the disk at which recording or reproduction of information is to be performed by the optical head;

a speed calculator for calculating a rotation speed of the motor; and

a determiner for determining, during a seek operation in which the head is transported, whether or not

the rotation speed of the motor is within a range in which information recording to the disk or information reproduction from the disk by the optical head is possible,

wherein when the determiner determines that the rotation speed is within the range, the motor controller restricts the driving current so that the rotation speed of the motor is constant for a prescribed time period.

27. A disk apparatus, comprising:

a motor for rotating a disk;

an optical head for recording information on the disk or for reproducing information from the disk;

a motor driver for supplying a driving current to the motor;

a motor controller for setting the driving current;

an acceleration detector for detecting an acceleration of the motor;

a heat quantity calculator for calculating a heat quantity of the motor at least based on the acceleration which is output by the acceleration detector;

a temperature calculator for calculating a temperature change in a prescribed area of the disk apparatus based on the heat quantity; and

a determiner for determining whether or not the temperature change is equal to or more than a prescribed threshold level,

wherein when the determiner determines that the temperature change is equal to or more than the prescribed threshold level, the motor controller restricts the driving current.

28. A speed detection device, comprising:

a movement distance indicating device for

generating a pulse each time a motor moves a prescribed movement distance;

a timer for counting a time duration between generations of the pulses; and

a speed calculator for calculating a speed of the motor based on the time duration each time the motor rotates a prescribed rotation distance which is obtained by multiplying by an integer the prescribed movement distance,

wherein the prescribed rotation distance is equal to a value obtained by multiplying by an integer a rotation distance corresponding to one rotation of the motor.

29. An acceleration detection device, comprising:

a speed detection device according to claim 28, wherein an acceleration is calculated from the speed.